CLAIMS:

1. A method of treating a stiffened blood vessel, said method comprising at least substantially encasing a stiffened portion of said blood vessel with an elastic membrane formed of biocompatible material such that said membrane engages said stiffened portion of said blood vessel to thereby reduce the external diameter of said stiffened portion of said blood vessel.

2. The method of claim 1 wherein said blood vessel is an artery.

3. The method of claim 2 wherein said blood vessel is the aorta

4. The method of claim 2 wherein said blood vessel is the ascending aorta.

5. The method of claim 1 wherein said stiffened portion of said blood vessel is a grafted synthetic portion of said blood vessel.

6. The method of claim 5 wherein said grafted synthetic portion is a woven polyester graft.

7. The method of claim 1 wherein said stiffened portion of said blood vessel is dilatated prior to treatment.

8. The method of claim 1 wherein said membrane is in the form of a sheet, said stiffened portion of said blood vessel being encased by wrapping said membrane sheet around the circumferential periphery of said stiffened portion of said blood vessel and securing opposing end portions of said membrane.

9. The method of claim 8 wherein said membrane sheet is wrapped around the entire circumferential periphery of said stiffened portion of said blood vessel portion.

10. The method of claim 8 wherein said membrane sheet is wrapped about a majority of the circumferential periphery of said stiffened portion of said blood vessel.

11. The method of claim 8 wherein the opposing end portions of said membrane sheet are secured by suturing.

12. The method of claim 8 wherein the opposing end portions of said membrane are secured by way of a clamp.

13. The method of claim 8 wherein the opposing end portions of said membrane are secured by welding.

14. The method of claim 8 wherein the opposing end portions of said membrane are secured by way of interlocking structures formed on, or fixed to, each of said opposing end portions.

15. The method of claim 8 wherein each opposing end portion is provided with a marking extending generally parallel with a free end edge of said end portion, said end portions being secured along or adjacent to said markings.

16. The method of claim 8 wherein said membrane sheet is formed by slitting a cylindrical membrane.

17. The method of claim 1 wherein said membrane is in the form of a spiral, said stiffened portion of said blood vessel being encased by spirally wrapping said membrane spiral around the circumferential periphery of said stiffened portion of said blood vessel.

18. The method of claim 1 wherein said membrane has a stiffness approximating that of a non-stiffened blood vessel of the type of blood vessel being treated.

19. The method of claim 1 wherein said membrane has a measurement of tensile stiffness x thickness of between 25 and 2500 N/m.

20. The method of claim 19 wherein said measurement of tensile stiffness x thickness is between 50 and 1000 N/m.

21. The method of claim 8, wherein said membrane, when formed into a cylinder having an internal diameter of 20 mm, has an average pressure-strain elastic modulus of between 0.15×10^6 and 15×10^6 dyn/cm^2 at a pulsatile pressure of 120/70 mmHg (16/9 kPa).

22. The method of claim 8, wherein said membrane, when formed into a cylinder having an internal diameter of 20 mm, has an average pressure-strain elastic modulus of between 0.3×10^6 and 6×10^6 dyn/cm^2 at a pulsatile pressure of 120/70 mmHg (16/9 kPa).

23. The method of claim 1 wherein said external diameter of said stiffened portion of said blood vessel is reduced by between 10% and 50% when encased with said membrane, at a pressure of 70 mmHg (9 kPa)

24. The method of claim 4 wherein said external diameter of said stiffened portion of said blood vessel is reduced to between 18 mm and 30 mm at a pressure of 70 mmHg (9kPa)

25. The method of claim 1 wherein said membrane is formed of an elastic silicon polymer.

26. The membrane of claim 1 wherein said membrane is formed of an elastic polyurethane.

27. The method of claim 1 wherein said method is carried out thoracoscopically.

28. A method of treating a blood vessel, said blood vessel having a native tissue portion and a synthetic portion grafted in line with said native tissue portion, said synthetic portion having a greater stiffness than the stiffness of said native tissue portion, said method comprising at least substantially encasing said synthetic portion with an elastic membrane formed of biocompatible material such that said membrane engages said synthetic portion to thereby reduce the external diameter of said synthetic portion.

29. The method of claim 28 wherein said synthetic portion is a woven polyester.

30. A device for treating a stiffened blood vessel, said device comprising an elastic membrane formed of a sheet of biocompatible material having two opposing end portions, said membrane being adapted to being wrapped around the circumferential periphery of a stiffened portion of said blood vessel and said opposing end portions secured to each other to thereby reduce the external diameter of said stiffened portion of said blood vessel, wherein each said end portion is provided with a marking extending generally parallel with a free end edge of said end portion, said marking being indicative of the location at which said opposing end portions are to be secured with said membrane wrapped about said stiffened portion of said blood vessel, the distance between said markings being selected as the circumference of a cylinder to be formed by wrapping said membrane sheet around said stiffened portion of said blood vessel.

31. The device of claim 30 wherein said membrane has a stiffness approximating that of a non-stiffened blood vessel of the type of blood vessel to be treated.

32. The device of claim 30 wherein said membrane has a measurement of tensile stiffness x thickness of between 25 and 2500 N/m.

33. The device of claim 32 wherein said measurement of tensile stiffness x thickness is between 50 and 1000 N/m.

34. The device of claim 30 wherein said distance between said markings is between 56 and 94 mm.

35. The device of claim 30 wherein said membrane, when formed into a cylinder having an internal diameter of 20 mm, has an average pressure-strain elastic modulus of between 0.15 x 10^6 and 15 x 10^6 dyn/cm^2 at a pulsatile pressure of 120/70 mmHg (16/9 kPa).

36. The device of claim 30 wherein said membrane, when formed into a cylinder having an internal diameter of 20 mm, has an average pressure-strain elastic modulus of between 0.3 x 10^6 and 6 x 10^6 dyn/cm^2 at a pulsatile pressure of 120/70 mmHg (16/9 kPa).

37. The device of claim 30 wherein said membrane is formed of an elastic silicon polymer.

38. The device of claim 30 wherein said membrane is formed of an elastic polyurethane.

39. A device for treating a stiffened blood vessel, said device comprising an elastic membrane formed of a sheet of biocompatible material having two opposing end portions, said membrane being adapted to being wrapped around the circumferential periphery of a stiffened portion of said blood vessel, wherein said device further comprises interlocking structures formed on, or fixed to, each said opposing end portion for securing said end portions about said stiffened portion of blood vessel to thereby reduce the external diameter of said stiffened portion of said blood vessel.

40. The device of claim 39 wherein said membrane has a stiffness approximating that of a non-stiffened blood vessel of the type of blood vessel being treated.

41. The device of claim 39 wherein said membrane has a measurement of tensile stiffness x thickness of between 25 and 2500 N/m.

42. The device of claim 41 wherein said measurement of tensile stiffness x thickness is between 50 and 1000 N/m.

43. The device of claim 39 wherein said membrane, when formed into a cylinder having an internal diameter of 20 mm, has an average pressure-strain elastic

modulus of between 0.15 x 10^6 and 15 x 10^6 dyn/cm^2 at a pulsatile pressure of 120/70 mmHg (16/9 kPa).

44. The device of claim 39 wherein said membrane, when formed into a cylinder having an internal diameter of 20 mm, has an average pressure-strain elastic modulus of between 0.3 x 10^6 and 6 x 10^6 dyn/cm^2 at a pulsatile pressure of 120/70 mmHg (16/9 kPa).

45. The device of claim 39 wherein said membrane is formed of an elastic silicon polymer.

46. The device of claim 39 wherein said membrane is formed of an elastic polyurethane.

47. A device for treating a stiffened blood vessel, said device comprising an elastic membrane formed of a sheet of biocompatible material having two opposing end portions, said membrane being adapted to being wrapped around the circumferential periphery of a stiffened portion of said blood vessel and said opposing end portions secured to each other to thereby reduce the external diameter of said stiffened portion of said blood vessel, wherein a series of markings are applied to a surface of said membrane.

48. The device of claim 47 wherein each of said markings extends generally parallel to a free end edge of each of said end portions.

49. The device of claim 47 wherein said membrane has a stiffness approximating that of a non-stiffened blood vessel of the type of blood vessel being treated.

50. The device of claim 47 wherein said membrane has a measurement of tensile stiffness x thickness of between 25 and 2500 N/m.

51. The device of claim 50 wherein said measurement of tensile stiffness x thickness is between 50 and 1000 N/m.

52. The device of claim 47 wherein said membrane, when formed into a cylinder having an internal diameter of 20 mm, has an average pressure-strain elastic modulus of between 0.15 x 10^6 and 15 x 10^6 dyn/cm^2 at a pulsatile pressure of 120/70 mmHg (16/9 kPa).

53. The device of claim 47 wherein said membrane, when formed into a cylinder having an internal diameter of 20 mm, has an average pressure-strain elastic modulus of between 0.3 x 10^6 and 6 x 10^6 dyn/cm^2 at a pulsatile pressure of 120/70 mmHg (16/9 kPa).

54. The device of claim 47 wherein said membrane is formed of an elastic silicon polymer.

55. The device of claim 47 wherein said membrane is formed of an elastic polyurethane.

56. A device for treating a stiffened blood vessel, said device comprising an elastic membrane formed of a sheet of biocompatible material having two opposing end portions, said membrane being adapted to being wrapped around the circumferential periphery of a stiffened portion of said blood vessel and said opposing end portions secured to each other to thereby reduce the external diameter of said stiffened portion of said blood vessel, wherein said membrane includes a radio-opaque marker.

57. The device of claim 56 wherein said radio-opaque marker is dispersed throughout said membrane.

58. The device of claim 56 wherein said radio-opaque marker is applied to a surface of said membrane.

59. The device of claim 56 wherein said membrane has a stiffness approximating that of a non-stiffened blood vessel of the type of blood vessel being treated.

60. The device of claim 56 wherein said membrane has a measurement of tensile stiffness x thickness of between 25 and 2500 N/m.

61. The device of claim 60 wherein said measurement of tensile stiffness x thickness is between 50 and 1000 N/m.

62. The device of claim 56 wherein said membrane, when formed into a cylinder having an internal diameter of 20 mm, has an average pressure-strain elastic modulus of between 0.15×10^6 and 15×10^6 dyn/cm^2 at a pulsatile pressure of 120/70 mmHg (16/9 kPa).

63. The device of claim 56 wherein said membrane, when formed into a cylinder having an internal diameter of 20 mm, has an average pressure-strain elastic modulus of between 0.3×10^6 and 6×10^6 dyn/cm^2 at a pulsatile pressure of 120/70 mmHg (16/9 kPa).

64. The device of claim 56 wherein said membrane is formed of an elastic silicon polymer.

65. The device of claim 56 wherein said membrane is formed of an elastic polyurethane.